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AUTHOR Muffo, John A.; Coccari, Ronald L.
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ABSTRACT

Variables that correlate highly with success in obtaining 1978 external funding for research among the 338 member institutions of the American Association of State Colleges and Universities (AASCU) were studied. It was found that AASCU institutions that have been successful in obtaining outside funds for research purposes do tend to place more emphasis, in both policy and resource allocation, on graduate teaching and internally and externally-funded research. Measures of size of faculty and student body, as well as doctoral work in several disciplines, were found to correlate significantly with grants at AASCU institutions. The best single predictor of success in 1978 was success four years earlier, with the existence of a grants administration office, dollar amount of grants four years earlier, and existence of an engineering doctorate also significantly contributing to predictability. It is concluded that AASCU institutions successful at obtaining externally-funded research money tended to have certain things in common: past success in obtaining grants; emphasis on graduate and particularly doctoral work; larger student bodies and faculties; and emphasis on research and publication for promotion and tenure purposes. (SW)

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Predictors of Outside Funding for Research Among AASCU Institutions

John A. Muffo
Director of Institutional Research
Cleveland State University
E. 24th and Euclid Avenue
Cleveland, Ohio 44115
(216) 687-4700

Ronald L. Coccari
Assoc. Prof., Quantitative Business Analysis
Cleveland State University
E. 24th and Euclid Avenue
Cleveland, Ohio 44115
(216) 687-4793

HE 014 099

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

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Mary Corcoran
University of Minnesota
(Editor, AIR Forum Publications)

Abstract

A summary of a survey concerning external funding for research of the 338 member institutions of the American Association of State Colleges and Universities (AASCU) is presented. Results indicate that AASCU institutions which have been successful in obtaining outside funds for research purposes do tend to place more emphasis, in both a policy sense and a resource allocation sense, on graduate teaching and internally and externally-funded research. Such information could prove to be useful to AASCU or similar institutions examining policies aimed at increasing the amount of external funding for research.

Predictors of Outside Funding for Research
Among AASCU Institutions

Introduction

In the difficult economic environment of the 1980's many colleges and universities are attempting to increase the amount of research funds attracted from external resources. Among these are members of the American Association of State Colleges and Universities (AASCU), a group of state-assisted colleges and universities whose past missions have not normally included externally-funded research as a high priority. As these institutions have matured, however, more of them have attempted to increase the amount of research undertaken by faculty and staff with the support of federal and other outside agencies. The following describes the variables which are common to those institutions which have been relatively successful in obtaining external funding for research.

Background

Over ten years ago Dunham (1969) wrote Colleges of the Forgotten Americans under the auspices of the then Carnegie Commission on Higher Education. This work focused on the AASCU institutions, which at that time were viewed as that segment of higher education catering to the "forgotten" American majority of students. During the period of rapid growth of enrollments of the 1960's, the AASCU institutions began to emerge from their teachers' college and technical institute beginnings into comprehensive colleges and universities in the classical manner described by Jencks and Riesman (1969). Since Dunham's work

appeared, little has been said collectively about these institutions of higher education existing today in an environment quite different from that described by him at that time.

In the late 1960's and early 1970's there was much speculation as to what direction the AASCU institutions would take as they grew in enrollments, became more academically comprehensive, and drew their students and faculty from a broader geographic and social range than in the past. According to the Jencks and Riesman thesis, they could have been expected to attempt to emulate the large, research-oriented universities by hiring faculty from the most prestigious universities whenever possible and encouraging these faculty to undertake scholarly research, including externally-funded research. There are data which suggest that the AASCU institutions as a whole hired more faculty from research-oriented doctoral programs in the 1970's than previously (Muffo and Robinson, 1981), but there is also evidence that many such faculty have been frustrated in attempting to do campus-based research, whether internally or externally funded (Darknell, 1981). The latter study suggests that faculty from prestigious universities do not, by themselves alone, guarantee a successful research program at a college or university.

Only a few studies have attempted to deal with the issue of which institutional variables do seem to be related to ability to obtain externally-funded research dollars, and these have been focused on the fifty or so universities which account for the vast majority of all such funds. Ellyson and Krueger (1980), for instance, found number of doctoral degrees granted and internally-funded research to be highly correlated with amount of federal research dollars received at 60 leading universities. Limitations of the Ellyson and Krueger study include

its restricted focus on the most successful universities in obtaining federal research funds and its use of only a few predictor variables (i.e., internal research funds, degrees awarded by level, and student headcount by level). There appears to be a gap in the literature concerning studies on externally-funded research success which are more broadly based in terms of both institution and predictor variables.

Methodology and Data Sources

Data for the study consisted of usable responses to a set of questions from 212 of 338 member AASCU institutions in the Fall of 1979 concerning institutional demographics and emphasis on research. A telephone follow-up of non-respondent institutions found them to be generally disinterested in obtaining external funds for research purposes; they typically describe themselves as being teaching institutions only. A list of the variables gathered by the questionnaire can be seen in Table 1.

One difficulty with the data as they were gathered via the questionnaire is that many of them were categorical as opposed to actual. In other words undergraduate student enrollment, as an example, was collected as to broad categories rather than gathering the actual enrollment figures themselves. Consequently the categorical data had to be converted into dummy variable form; undergraduate enrollment of under 5,000 was coded as a zero and that 5,000 and above was coded as a one for instance. In the absence of a more compelling logic, decisions on break points for the dummy variables were based on the mean responses to particular questions, thus yielding a reasonable number of dummy variables for each response.

TABLE 1
(about here)

Since the purpose of the study was to determine which variables correlate highly with success in obtaining external funding, the two most recent measures of funding success, i.e., number of grants in 1978 and amount of grants in 1978, were designated as the dependent variables, while all other institutional characteristics were considered independent. Simple correlations were computed to determine the strength of the relationships between funding success and the other variables. Multiple correlation was utilized to determine which few variables most frequently coexist with funding success, as well as how well that success can be predicted from the knowledge of the other variables present.

Results

Table 2 shows the significant correlations between one measure of success in obtaining external research funds, i.e., the number of grants awarded in 1978, and the other institutional characteristics. Measures of size of faculty and student body, as well as doctoral work in several disciplines, were found to correlate significantly with grants at AASCU institutions, just as they have been found to do so at the high prestige, research universities studied by others. Additional, more controllable, factors such as emphasis on research and publication, availability of internal grants, and resources allocated to grants administration and external liaison were also found to be significant in relation to grant success.

TABLE 2
(about here)

Multiple regression was utilized to determine which few variables best predict success in the grants area. As can be seen in Table 2, the best single predictor of success in 1978 was success four years earlier, with the existence of a grants administration office, dollar amount of grants four years earlier, and existence of an engineering doctorate also adding significantly to the prediction equation. Of the total variation of number of grants among the 90 institutions for which data were available on the dependent variable and all of the independent variables, 87% was explained by only four variables.

The logic of predicting funding success in 1978 based upon funding success in 1974 appears quite reasonable, but it may also preclude other important variables from the prediction equation, e.g., those which correlate highly with success in 1974. Consequently multiple regression was utilized in building a prediction equation for a second time without including the two measures of funding success in 1974. The results can be seen in Table 3. When the other two variables are removed, the number of internal grants in 1974 becomes the best predictor of funding success, with the existence of a grants administration office and offering of the education doctorate also adding significantly to the prediction equation. Only 37% of the variance in the number of grants is predicted however.

TABLE 3
(about here)

The amount of grants in thousands of dollars, like the number of grants, was found to be significantly correlated with demographic variables such as size of institution and metropolitan area, as well as the existence of doctoral in certain disciplines. The more controlable factors such as emphasis on research and internal resources allocated to research likewise showed a relationship with amount of funding, as can be seen in Table 4. The prediction equation found success in 1974 to again be the best predictor of success in 1978, but other variables such as doctorates in arts and sciences, engineering, and education, as well as amount of internal grants and importance placed on the need for funding the research of assistant professors, were also found to add significantly to the prediction equation. Inclusion of these variables allows the prediction of 84% of the variation in funding amounts.

TABLE 4
(about here)

Removing the measures of funding success in 1974 yields the significant predictors identified in Table 5. Both number and amounts of internal grants in 1974 are the strongest predictors of funding success, while size of the metropolitan area and the existence of a doctoral program in education add significantly. Only 34% of the variance in funding dollars is predicted by these variables however.

TABLE 5
(about here)

Discussion

The limitations to the study revolve around those of the data sources and methodology. In addition to the usual problems of response bias and errors in filling our questionnaires and the incomplete nature of many of them, more than a few of the data elements were gathered in a categorical format which could limit their power to correlate and predict. The use of statistical techniques such as simple correlation and multiple regression also have their limitations, the most basic of which is that no cause-effect relationship can be assumed to exist. The correlation of many of the independent variables with each is a further complication, although not an overwhelming one.

What the data do show, despite these limitations, is that the AASCU institutions successful at obtaining externally funded research money do tend to have certain things in common: past success in obtaining grants; emphasis on graduate, particularly doctoral work; larger student bodies and faculties; urban enfironments; internal grant programs; grants and administration offices; and emphasis on research and publication for promotion and tenure purposes. Obviously institutions attempting to increase the amount of externally-funded research cannot change variables such as past success and the population in their metropolitan area; most are restricted as to total enrollments and graduate programs as well. Many of the other factors, however, are controllable at the institutional level.

The results of this study suggest that those AASCU member institutions seriously considering an increased research effort can make decisions which increase the probability of success. Emphasizing research and publication in

promotion and tenure decisions is perhaps the easiest to implement, but to do so in the absence of support for these activities may be unfair and even counterproductive. The initiation of an internal grants program, whereby faculty apply for institutional funds for specific projects, can provide seed funds for outside grants as well as provide experience in grantsmanship. An office devoted exclusively to the pursuit of externally-funded research could be an added stimulus. Resource allocation decisions such as these provide support for research while also publicly demonstrating that the institution is serious about such a commitment.

Besides demonstrating how an institution might pursue more externally-funded research, the data gathering portion of the study also pointed up the fact that many AASCU institutions are not seriously interested in pursuing such funds. Whether statements were made directly or indirectly through policy and resource allocation questions, the fact is that many AASCU members do not see themselves to be emulating the major research universities as was feared by Dunham (1969). This finding supports the position of Baldridge, Curtis, Ecker, and Riley (1977) that American higher education is becoming more diverse rather than more homogeneous. It also raises the issue, however, of possible frustration experienced by AASCU faculty trained at the more research-oriented universities who are now cut off from pursuing research.

Conclusion

This study used demographic and policy data gathered in 1979 from a sample of member institutions of the American Association of State Colleges and Universities (AASCU) to determine if relationships exist between these variables

and success at obtaining externally-funded research grants. It was found that success in gaining grants is significantly correlated with factors such as past success, emphasis on doctoral study, size of student body and faculty, urban environment, existence of an internal grants program and grants administration office, and emphasis on research and publication for promotion and tenure purposes. Despite the fact that no cause-and-effect relationship can be posited between these variables and external funding success, there does appear to be a set of criteria common to the more successful institutions. The demographic variables are basically outside of control by institutional decision-makers, but internal policy and resource allocation decisions may well help to increase the number and dollar amounts of externally-funded research grants.

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TABLE 1

Institutional Variables
of AASCU Institutions

Degree levels by academic field*
Number of undergraduates, 1974 and 1978*
Number of graduate students, 1974 and 1978*
Percent of students from out-of-state
State limitations on out-of-state students*
State limitation on institutional enrollment*
Existence of enabling legislation in the state*
Existence of collective bargaining at the institution*
Number of assistant professors, 1974 and 1978*
Number of other faculty, 1974 and 1978*
Number of research grants, 1974 and 1978
Amount of research grants, 1974 and 1978
Percentage of grants held by assistant professors, 1974 and 1978
Number of graduate students supported from external funds
Perceived importance of increased external funding for assistant professors*
Federal and state mailing lists*
Research publication subscriptions*
Existence of grants administration staff*
Existence of external liaison for research purposes*
Reception of research information from institutional associations*
Perceived need for research information from associations*
Availability of internal grants*
Number of internal grants, 1974 and 1978
Amount of internal grants, 1974 and 1978
Percentage of internal grants held by assistant professors, 1974 and 1978
Tenure weight given to: research funding*
scholarly publications*
teaching effectiveness*
service*
Three major current problems facing the institution

* Dummy variables

TABLE 2

Relationships Between Number of Grants in 1978 and Significantly Correlated Institutional Characteristics (1974 Grant Data Included)

Variable	n	Simple Correlation	Beta Weight#
Arts and sciences doctorate	202	.42**	
Business doctorate	202	.17*	
Engineering doctorate	202	.27**	-7.45 (4)
Education doctorate	202	.46**	
Metropolitan area over 100,000	202	.24**	
Over 5,000 undergraduates in 1978	202	.45**	
Over 5,000 undergraduates in 1974	202	.45**	
Over 75 assistant professors in 1978	202	.44**	
Over 75 assistant professors in 1974	202	.42**	
Over 100 other faculty in 1978	202	.46**	
Over 100 other faculty in 1974	184	.51**	
Number of grants in 1974	171	.89**	.99 (1)
Amount of grants in 1974	173	.75**	.01 (3)
Funding for assistant profs. important	202	.29**	
Grants administration office	198	.48**	7.94 (2)
External liaison	197	.19**	
Internal grants available	197	.35**	
Number of internal grants in 1978	134	.45**	
Amount of internal grants in 1978	141	.44**	
Number of internal grants in 1974	113	.51**	
Amount of internal grants in 1974	124	.43**	
Publications emphasized for tenure	202	.29**	
Intercept			.40

*p < .05

**p < .01

#R^2 = .87; n = 90; number in parentheses is order in which variables entered the prediction equation

TABLE 3

Relationships Between Number of Grants in 1978 and Significantly Correlated Institutional Characteristics (1974 Grant Data Excluded)

Variable	n	Simple Correlation	Beta Weight[#]
Arts and sciences doctorate	202	.42**	
Business doctorate	202	.17*	
Engineering doctorate	202	.27**	
Education doctorate	202	.46**	16.24 (3)
Metropolitan area over 100,000	202	.2[illegible]**	
Over 5,000 undergraduates in 1978	202	.4[illegible]**	
Over 5,000 undergraduates in 1974	202	.45**	
Over 75 assistant professors in 1978	202	.44**	
Over 75 assistant professors in 1974	202	.42**	
Over 100 other faculty in 1978	202	.46**	
Over 100 other faculty in 1974	184	.51**	
Funding for Assistant profs. important	202	.29**	
Grants administration office	198	.48**	17.58 (2)
External liaison	197	.19**	
Internal grants available	197	:35**	
Number of internal grants in 1978	134	.45**	
Amount of internal grants in 1978	141	.44**	
Number of internal grants in 1974	113	.51**	.38 (1)
Amount of internal grants in 1974	124	.43**	
Publications emphasized for tenure	202	.29**	
Intercept			2.07

*p < .05
**p < .01
[#]R^2 = .37; n = 97; number in parentheses is order in which variables entered the prediction equation

TABLE 4

Relationships Between Amount of Grants in 1978 in Thousands of Dollars Significantly Correlated Institutional Characteristics (1974 Grant Data Included)

Variable	n	Simple Correlation	Beta Weight#
Arts and sciences doctorate	212	.37**	-423.74 (4)
Business doctorate	212	.24**	
Engineering doctorate	212	.17*	-383.83 (6)
Education doctorate	212	.41**	871.86 (2)
Metropolitan area over 100,000	212	.26**	
Over 5,000 undergraduates in 1978	212	.33**	
Over 5,000 undergraduates in 1974	212	.34**	
Over 3,000 graduate students in 1978	212	.17*	
Over 75 assistant professors in 1978	212	.37**	
Over 75 assistant professors in 1974	212	.33**	
Over 100 other faculty in 1978	212	.38**	
Over 100 other faculty in 1974	193	.40**	
Number of grants in 1974	172	.77**	
Amount of grants in 1974	187	.80**	1.52 (1)
Funding for assistant profs. important	212	.25**	251.97 (5)
Grants administration office	208	.40**	
Internal grants available	207	.25**	
Number of internal grants in 1978	138	.35**	
Amount of internal grants in 1978	149	.34**	
Number of internal grants in 1974	116	.52**	
Amount of internal grants in 1974	130	.46**	2.44 (3)
Publications emphasized for tenure	212	.28**	
Intercept			-114.35

*$p < .05$
**$p < .01$
#$R^2 = .84$; n = 90; number in parentheses is order in which variables entered the prediction equation

TABLE 5

Relationships Between Amount of Grants in 1978 in Thousands of Dollars and Significantly Correlated Institutional Characteristics (1974 Grant Data Excluded)

Variable	n	Simple Correlation	Beta Weight#
Arts and sciences doctorate	212	.37**	
Business doctorate	212	.24**	
Engineering doctorate	212	.17*	
Education doctorate	212	.41**	468.16 (4)
Metropolitan area over 100,000	212	.26**	408.52 (2)
Over 5,000 undergraduates in 1978	212	.33**	
Over 5,000 undergraduates in 1974	212	.34**	
Over 3,000 graduate students in 1978	212	.17**	
Over 75 assistant professors in 1978	212	.37**	
Over 75 assistant professors in 1974	212	.33**	
Over 100 other faculty in 1978	212	.38**	
Over 100 other faculty in 1974	193	.40**	
Funding for assistant profs. important	212	.25**	
Grants administration office	208	.40**	
Internal grants available	207	.25**	
Number of internal grants in 1978	138	.35**	
Amount of internal grants in 1978	149	.34**	
Number of internal grants in 1974	116	.52**	15.45 (1)
Amount of internal grants in 1974	130	.46**	3.75 (3)
Publications emphasized for tenure	212	.28**	
Intercept			120.48

*p .05
**p .01
#R^2 = .34; n = 100; number in parentheses in order in which variables entered the prediction equation